

## Saponite Mineral Data

**Saponite**

Mineral Data



Pronunciation Guide



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## General Saponite Information

**Chemical Formula:**  $(\text{Ca}/2, \text{Na})0.3(\text{Mg}, \text{Fe}^{++})3(\text{Si}, \text{Al})4\text{O}10(\text{OH})_2 \cdot 4(\text{H}_2\text{O})$ **Composition:** Molecular Weight = 480.19 gm

Sodium	0.48 %	Na	0.65 %	$\text{Na}_2\text{O}$
Calcium	0.83 %	Ca	1.17 %	$\text{CaO}$
Magnesium	11.39 %	Mg	18.89 %	$\text{MgO}$
Aluminum	5.62 %	Al	10.62 %	$\text{Al}_2\text{O}_3$
Iron	8.72 %	Fe	11.22 %	$\text{FeO}$
Silicon	17.55 %	Si	37.54 %	$\text{SiO}_2$
Hydrogen	2.10 %	H	18.76 %	$\text{H}_2\text{O}$
Oxygen	53.31 %	O		

100.00 %      98.83 % = TOTAL OXIDE

**Empirical Formula:**  $\text{Ca}_{0.1} \text{Na}_{0.1} \text{Mg}_{2.25} \text{Fe}^{2+}_{0.75} \text{Si}_3\text{AlO}_{10}(\text{OH})_2 \cdot 4(\text{H}_2\text{O})$ **Environment:** Amygdaloidal cavities in basalts.**IMA Status:** Valid Species (Pre-IMA)**Locality:** Lizard Head in Cornwall, England. Link to MinDat.org Location Data.**Name Origin:** From the Latin, *sapo* meaning "soap."**Synonym:** Griffithite-Ferroan

Piotine

## Saponite Image

**Images:****Saponite****Comments:** Light brown saponite pseudomorphs after stilbite crystals up to 6 mm.**Location:** Thetford Mines, Mégantic Co., Québec, Canada. **Scale:** 25x25x12 mm.

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## Saponite Crystallography

**Axial Ratios:**  $a:b:c = 0.5786:1:1.3537$ **Cell Dimensions:**  $a = 5.3, b = 9.16, c = 12.4, Z = 2; \beta = 96.5^\circ V = 598.13 \text{ Den}$   
(Calc) = 2.67

## Saponite Mineral Data

**Crystal System:** Monoclinic - Prismatic H-M Symbol (2/m) Space Group: C 2/m  
 **X Ray Diffraction:** By Intensity( $I/I_0$ ): 12.3(1), 1.53(0.7), 3.1(0.5).

## Physical Properties of Saponite

**Cleavage:** [001] Perfect  
 **Color:** White, Yellowish white, Greenish white, Reddish white, Bluish white.  
 **Density:** 2.3  
 **Diaphaniety:** Subtranslucent to opaque  
 **Fracture:** Earthy - Dull, clay-like fractures with no visible crystalline affinities, (e.g. howlite).  
 **Habits:** Massive - Uniformly indistinguishable crystals forming large masses., Granular - Generally occurs as anhedral to subhedral crystals in matrix.  
 **Hardness:** 1.5-2 - Talc-Gypsum  
 **Luminescence:** None.  
 **Luster:** Earthy (Dull)  
 **Streak:** white

## Optical Properties of Saponite

**Gladstone-Dale:**  $Cl_{meas} = 0.026$  (Excellent) - where the  $Cl = (1 - KPD_{meas}/KC)$   
 $Cl_{calc} = 0.161$  (Poor) - where the  $Cl = (1 - KPD_{calc}/KC)$   
 $KPD_{calc} = 0.1899, KPD_{meas} = 0.2204, KC = 0.2264$   
 **Optical Data:** Biaxial (-),  $a = 1.479-1.49$ ,  $b = 1.51-1.525$ ,  $g = 1.511-1.527$ ,  
 $bire = 0.0320-0.0370$ ,  $2V(Calc) = 20-26$ ,  $2V(Meas) = 0-10$ . Dispersion none.

## Calculated Properties of Saponite

**Electron Density:**  $\rho_{electron} = 2.32 \text{ gm/cc}$   
note:  $\rho_{Saponite} = 2.30 \text{ gm/cc}$ .  
 **Photoelectric:**  $PE_{Saponite} = 3.76 \text{ barns/electron}$   
 $U = PE_{Saponite} \times \rho_{electron} = 8.75 \text{ barns/cc}$ .  
 **Radioactivity:**  $GR_{API} = 0$  (Gamma Ray American Petroleum Institute Units)

Saponite is Not Radioactive

## Saponite Classification

**Dana Class:** 71.3.1b.2 (71) Phyllosilicate Sheets of Six-Membered Rings  
(71.3) with 2:1 clays  
(71.3.1b) Smectite group (Trioctahedral Smectites)  
71.3.1b.1 Saponite  $(K,Ca,0.5)0.33(Mg,Al)3(Si,Al)O10(OH)2 \cdot 5(H_2O)$  Unk. Mono  
71.3.1b.2 Saponite  $(Ca/2,Na)0.3(Mg,Fe)3(Si,Al)4O10(OH)2 \cdot 4(H_2O)$  C 2/m 2/m  
71.3.1b.3 Sauconite  $Na0.32n3(Si,Al)4O10(OH)2 \cdot 4(H_2O)$  C 2/m 2/m  
71.3.1b.4 Hectorite  $Na0.3(Mg, Li)3Si4O10(OH)2$  C 2/m 2/m  
71.3.1b.5 Pimelite\*  $Ni3Si4O10(OH)2 \cdot 4(H_2O)$  Unk. Hex  
71.3.1b.6 Slatersite  $(Ca0.5,Na)0.33(Mg,Fe)3Si4O10(OH)2 \cdot n(H_2O)$  Unk (ORTH ?) Mono  
71.3.1b.7 Yakhontovite  $(Ca,K)0.5(Cu,Fe,Mg)2Si4O10(OH)2 \cdot 3(H_2O)$  C 2/m 2/m  
71.3.1b.8 Zincsillite  $Zn3Si4O10(OH)2 \cdot 4(H_2O)$  (?) C 2/m 2/m

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## Saponite Mineral Data

71.3.1b.9 IMA2002-0281  $\text{Ca}_0.3(\text{Fe},\text{Mg},\text{Fe})_3(\text{Si},\text{Al})_4\text{O}_{10}(\text{OH})_2 \cdot 4\text{H}_2\text{O}$  C? Mono

## [2] Strunz Class:

**VIII/H.20-20** VIII - Silicates  
 VIII/H - Phyllosilicates (layered) Mica like with  $[\text{Si}_4\text{O}_{10}]^{4-}$  and  
 related groups  
 VIII/H.20 - Hectorite - Zicsilite series

VIII/H.20-10 Hectorite  $\text{Na}_0.3(\text{Mg},\text{Li})_3\text{Si}_4\text{O}_{10}(\text{OH})_2 \cdot \text{C} \cdot 2/\text{m}$  2/mVIII/H.20-20 Saponite  $[\text{Ca}/2,\text{Na}]_0.3(\text{Mg},\text{Fe})_3(\text{Si},\text{Al})_4\text{O}_{10}(\text{OH})_2 \cdot 4(\text{H}_2\text{O}) \cdot \text{C} \cdot 2/\text{m}$  2/mVIII/H.20-30 Spodolite  $\text{MgSiO}_2(\text{OH})_2 \cdot (\text{H}_2\text{O})$  (?) NoneVIII/H.20-40 Stevensite  $(\text{Ca}0.5,\text{Na})_0.33(\text{Mg},\text{Fe})_3\text{Si}_4\text{O}_{10}(\text{OH})_2 \cdot \text{n}(\text{H}_2\text{O})$  Link (ORTH ?) MonoVIII/H.20-50 Sauconite  $\text{Na}_0.3\text{Zn}_3(\text{Si},\text{Al})_4\text{O}_{10}(\text{OH})_2 \cdot 4(\text{H}_2\text{O}) \cdot \text{C} \cdot 2/\text{m}$  2/mVIII/H.20-60 Zicsilite  $\text{Zn}_3\text{Si}_4\text{O}_{10}(\text{OH})_2 \cdot 4(\text{H}_2\text{O})$  (?) C 2/m ? 2/m

## Other Saponite Information

## [2] References:

NAME( Duda&amp;Rej(90) PHYS. PROP.(Enc. of Minerals,2nd ed.,1990) OPTIC PROP.(Ford32)

## [2] See Also:

## Links to other databases for Saponite :

1 - Alkali-Nuts(English) 2 - Alkali-Nuts(Francais) 3 -Athena 4 - Crocoite.com Mineral Locations 5 - EUROmin Project 6 -Google Images 7 -Handbook of Mineralogy 8 -MinDAT 9 -MinMax (Deutsch) 10 -MinMax(English) 11 - Minerals of Wisconsin 12 - École des Mines de Paris

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